

# DIFFRACTIVE WAVE MODULATING DEVICES

## Abstract

A zone plate modulator modulates an incident wave by changing the relative distance between a pair of complementary reflective zone plates. The modulator acts to reflect the incident wave as a plane mirror in a first configuration, and to diffract the incident wave into a series of focal points along the axis of the modulator as a phase zone plate in a second configuration. A force applied to the zone plates changes the zone plate modulator between the first and second configurations, therefore modulating the incident wave. The force can be an electrostatic force generated by a voltage source. An array of zone plate modulator elements is a compact spot array generator performing both the modulating and focusing functions. An achromatic zone plate modulator provides a both wavelength and polarization independent modulation of the incident wave. A variable optical attenuator comprises achromatic zone plate modulators.